Increasing Cultural Accessibility in a Global Organization

Jennifer Thom-Santelli, David R. Millen
IBM T.J. Watson Research
1 Rogers Street
Cambridge, MA USA 02140
{jthomsa, david_r_millen}@us.ibm.com

Chen-Hsiang Yu
MIT CSAIL
32 Vassar Street
Cambridge, MA USA 02139
chyu@mit.edu

ABSTRACT
Large global corporations have deployed social software to encourage information sharing and informal communication between geographically distributed employees. Recent research has observed geographically local differences in participation rates and perceived benefits of these systems. We suggest that increasing participation in organizational social software so that it is representative of the demographics of an enterprise is a valuable goal and propose a framework to encourage intercultural collaboration and communication. Finally, we describe the design of *Clearly*, a prototype system that improves readability of social software content for non-native English speakers so that multi-lingual employees can consume more of the available content in the system.

Author Keywords
Social software, cultural accessibility, intercultural collaboration, readability

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION
Social software has been deployed within large global corporations to facilitate informal communication and the development of social capital among distributed employees [3,8]. As intercultural, transnational and cross-functional distributed teams form, employees can use these systems to make sense of the values and norms of an organization to which they belong [8]. In addition, members of a global enterprise can employ organizational social networking sites for people sensemaking and widen their social circle by discovering contacts through articulated networks [3].

Recently, we have observed that users from different geographies and cultures perceive differential benefits from social software and social networking within an enterprise [10], formed networks with varying levels of diversity and have participated in differing levels of intensity [9]. The results from these studies suggest that there are cultural and geographical factors that may influence contribution patterns in social software systems in a global organization. As a result, participation in social systems in an enterprise may not be necessarily representative of the demographics of an organization and expertise possessed by employees from certain regions may not be as visible to other members of the organization. In addition, differential participation may also lead to gaps in knowledge acquisition from certain regions, where those who do not participate may be less aware of the informal expertise sharing that occurs within social software.

Such patterns are potentially problematic for a number of reasons. First, if contributors are too similar whether through organizational or geographical participation, an echo chamber may result where dominant perspectives may stifle innovation and alternative viewpoints. Second, if certain groups are disproportionately visible via participation, they may also retain an advantageous position within the organization, to the detriment of users from emerging regions that may be less fluent in the dominant language of the country [5,6]. At the same time, however, encouraging participation in one's native language is important, particularly to encourage the development of local knowledge and the development of subgroup identity in newer parts of the organization.

We propose a framework that addresses how social software systems can be employed to support intercultural communication and collaboration to encourage diverse participation while also supporting the development of regional expertise. We have identified two concepts, cultural accessibility and cultural fluency, in support of this framework (Figure 1). First, *cultural accessibility* addresses broad gaps in access through such issues as language, visual design, and localization. Cultural accessibility deals specifically with the interaction issues that deal with structural forms of misunderstandings and miscommunication. *Cultural fluency* describes the problems that arise when there are mismatches in values, customs and norms. Such mismatches include perceptions of hierarchy, norms of approach, differences in praise and rewards.

In this position paper, we focus on issues of cultural accessibility and describe the design of Clearly, a prototype system by improving readability of social software for non-native English speakers. The intent of this prototype is to improve the content consumption experience for non-native English speakers and to uncover hidden content in one's native language.

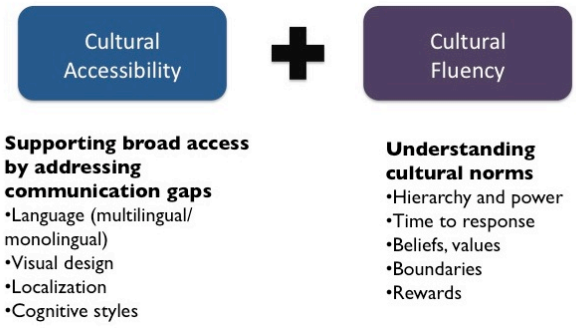

Figure 1. Examples of cultural accessibility and cultural fluency issues influencing intercultural collaboration.

CLEARLY: A CULTURAL ACCESSIBILITY PROTOTYPE

Clearly provides a number of design transformation and selective translation to help non-native English speakers find blog content of interest and read selected blog posts more easily. We focused on blogs as IBM facilitates employee blogging as a way to facilitate to encourage collaboration among diverse communities of readers by facilitating access to knowledge and resources [4].

We conducted a pilot interview study with 6 non-native English speakers (3 from China, 3 from Japan) who were active bloggers and readers of an enterprise blogging tool deployed within a large multinational technology organization. On average, the 6 participants (5 M, 1 F) have been speaking and reading English for 17.2 (SD = 7.1) years. We conducted interviews face-to-face, over the phone and through email (2 for each type). We used email in instances where participants preferred to have written questions to have more time to read and understand what was being asked of them. We asked participants to browse and select two blog posts to read from the enterprise blogging tool and asked them a series of semi-structured interview questions during these tasks.

From these initial observations, we noted two main challenges for non-native English readers: finding an interesting blog post to read and reading blog posts as currently rendered. The first challenge relates to the initial list display of the blog posts, which participants found difficult to scan and filter, mainly because of the number of items shown. Participants did not use the current filtering features (e.g. tag cloud, featured blogs, most commented blogs) except for a filter indicating blog posts recommended by other users, bur relied mainly on scanning. The 3 Japanese participants also chose to read blog posts that were in their native language, when available.

The second challenge deals with the blog posts itself, once one has been selected for reading. Participants commented that they did not attend to anything in the left hand navigation or the right sidebar while reading the blog post. We also observed that our participants employed support strategies, as defined by Sheorey and Mokhari [7], in which participants expressed interest in highlighted keywords or translated terms.

SYSTEM DESIGN AND IMPLEMENTATION

The context in which readability is applied in this study differs slightly from prior research describing readability for non-native English readers [11]. Such work focused on the display of longer blocks of text and stripping out content, such as advertisements, that serves as distractions. These techniques remain useful for formatting blog posts, once selected by the reader. We observe, however, that finding a blog post of interest by reading and scanning a long list of entries also poses difficulty for non-native English speakers. As a result, we include the initial list display, as well as the blog post itself, as interfaces that can be enhanced for readability.

Clearly: A Prototype to Enhance Blog Readability

We then implemented a Firefox extension, *Clearly*, to address the readability issues in both the blog list and blog post content view. *Clearly* uses a knowledge repository to assist in reading by providing resources for support strategies (e,g, reference tools, highlighted text). The knowledge repository is a JSON-format structure created dynamically to encode knowledge as a term and its properties. The repository includes a multilingual vocabulary dictionary and a terminology book to define enterprise-specific words.

As Figure 2 illustrates, there are only three buttons in the design: Settings, Simplifier and Documenter. The Settings button collects the reader's basic information and preferences. When the user clicks on the Settings button, a sidebar shows up to collect reader's personal information (e.g e-mail, preferred language, keywords of interest) to construct the user's Reading Settings (RS). In order to construct a geographically-based filter for blog posts, we use the reader's email address as a key to obtain profile data from the corporate directory. The corporate directory provides Profile APIs, which returns a JSON format file with reader's personal information, including name, office location, telephone, photo, etc. We use this geographic information to construct a three-level relationship: close-to-reader, the-same-country, different-country. We save the indicated preferences to a local database; in this case, the Firefox browser's default database, SQLite, for local

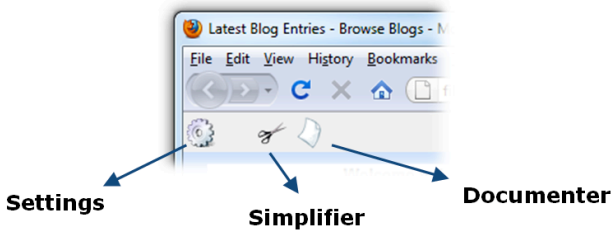

Figure 2. The Clearly toolbar.

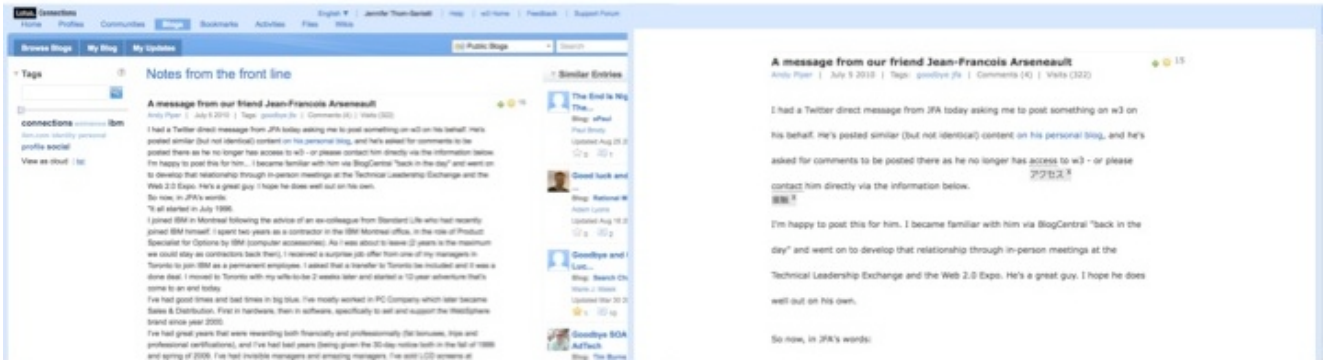

Figure 3. (Left to right). A blog post transformed by the Documenter feature of Clearly.

storage.

When the reader clicks on the Simplifier button, the application uses JavaScript with rule-based methods to parse the DOM tree of the currently viewed HTML page and extract blog post entries for content filtering into the three categories gathered from the Reader Settings: reader's native language, blog posts recommended by other readers, and blog authors whose geographic location is close to the reader. We detect the language of each blog post by sending random words from the blog title and abstract to a web-based language detector (e.g. Google Language Detector).

This filtering addresses the concerns of the first level of blog readability in aiding the scanning and browsing activities of the non-native English reader. The Simplifier button decreases distraction by transforming the right-hand and left-hand columns to increase whitespace. To provide additional context for recognition and topic selection for the novice browser, we increased the number of words in the snippet text. We also addressed the user-expressed preference for native-language blogs by emphasizing those posts in its own category. Filtering blog posts by geography serves two purposes: to facilitate discovery of nearby co-workers who are not related in an org-chart explicitly and to uncover blog posts from writers whose native language may be the same as the reader's.

When a reader chooses a blog post to read, he or she can click on the Documenter button to apply the content transformations that address the second level of blog readability to provide resources for the support strategies used by non-native English readers [7]. There are two distinct formatting transformations: advanced content presentation with keywords highlighted and line spacing with annotations. A slider is used to switch these two transformations (Figure 3). First, when the Documenter button is selected, the original blog content is transformed to the first format, which improves the general usability issues by removing the content from the left-hand and right-hand columns to decrease distractions and adding additional whitespace between paragraphs for increased legibility. In addition, we change font type and line width and highlight keywords of reader's interest, which is saved in RS. Second, when reader switches the slider to line spacing with annotations format, the CSS property, line-height, of the viewing page will become three times larger to give more whitespace between lines.

In addition to keyword highlighting, we provide word-based translation, consistent with Sheorey and Mokhtari's support strategies [7]. From the knowledge repository created when Clearly's initialization process, we assemble a vocabulary set containing English words of intermediate and advanced difficulty drawn from shared publicly available English-learning resources.

When a user initiates the Documenter function, the application tokenizes the blog post content. If any terms from the selected blog post matches one in the vocabulary set, we provide translation for each term in the reader's native language. Each of the translated words is highlighted, but we also provide a close button to each annotated word to remove the translation support if desired. As the reader uses the Documenter feature in *Clearly* to read multiple blog posts or becomes more confident in their knowledge of terminology in these blogs, we save these preferences so that users do not encounter redundant translation.

CONCLUSION AND FUTURE WORK

Our motivation for designing *Clearly* draws from our observation that non-native language readers may not avail themselves of the potential resources found within enterprise blogs. Based on research describing the browsing behaviors of novices and the support strategies employed by English-as-a-Second Language readers, we prototyped *Clearly*, a novel application that enhances blog readability on two levels: by improving the browse and scan process and providing additional resources for readers to use support strategies if desired. Future work includes large-scale deployment and evaluation with non-native English readers in the organization.

From these initial findings, we hope to learn more about factors influencing cultural accessibility and subsequently address differences in cultural fluency in the next stages of our research. We realize, however, that issues surrounding participation and contribution to social systems within a transnational enterprise are extremely complex. For

instance, there are local organizational norms, depending on one's job role, as well as norms of adoption influenced by access controls (e.g. on-the-job website blocking) or notions of privacy and appropriateness. Our future research in this area also intends to better document the relationships between local practice and organizational culture.

REFERENCES

1. Beyene, T., Hinds, P.J., and Cramton, C. Walking Through Jelly: Language Proficiency, Emotions, and Disrupted Collaboration in Global Work. Harvard Business School Working Paper, No. 09-138, June 2009.
2. Crystal, D. *English as a global language*. Cambridge Univ Press, 2003.
3. DiMicco, J., Millen, D.R., Geyer, W., Dugan, C., Brownholtz, B., and Muller, M. Motivations for social networking at work. *Proc.CSCW2008*, ACM (2008), 711-720.
4. Huh, J., Jones, L., Erickson, T., Kellogg, W.A., Bellamy, R.K.E., and Thomas, J.C. BlogCentral: the role of internal blogs at work. In *Ext.Abstracts.CHI2007*, ACM (2007), 2447-2452.
5. Marschan-Piekkari, R., Welch, D., and Welch, L. In the shadow: the impact of language on structure, power and communication in the multinational. *International Business Review 8*, 4 (1999), 421-440.
6. Park, H., Dai Hwang, S., and Harrison, J.K. Sources and consequences of communication problems in foreign subsidiaries: The case of United States firms in South Korea. *International Business Review 5*, 1 (1996), 79-98.
7. Sheorey, R. and Mokhtari, K. Differences in the metacognitive awareness of reading strategies among native and non-native readers. *System 29*, 4 (2001), 431-449.
8. Thom-Santelli, J. and Millen, D.R. Learning by seeing: photo viewing in the workplace. *Proc.CHI2009,* ACM (2009), 2081-2090.
9. Thom-Santelli, J., Millen, D., and DiMicco, J. Characterizing Global Participation in an Enterprise SNS. In *Ext.Abstracts.ICIC2010*, ACM (2010).
10. Thom-Santelli, J., Millen, D., and Gergle, D. Organizational Acculturation and Social Networking. *Proc.CSCW2011*, to appear, ACM (2011).
11. Yu, C.H. and Miller, R.C. Enhancing web page readability for non-native readers. *Proc.CHI2010*, ACM (2010), 2523-2532.